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Rubber dam may increase the survival time of dental restorations

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Rubber dam isolation in restorative dentistry

Abstract from:
Wang Y, Li C, Yuan H, Wong MCM, Zou J, Shi Z, Zhou X. Rubber dam isolation for restorative treatment in dental patients. *Cochrane Database of Systematic Reviews* 2016, Issue 9. Art. No.: CD009858. DOI: 10.1002/14651858.CD009858.pub2.

Question: Are outcomes of restorations improved when placed under rubber dam isolation compared to other forms of isolation?

The benefit of using rubber dam for endodontic treatment has long been recognised. Not only has it been found to improve endodontic outcomes[1], but also protects tissues from potentially harmful irrigants and guards the airway when using fine endodontic instruments which could pose an aspiration risk[2]. This Cochrane systematic review sets out with a clear objective to compare the effects of rubber dam isolation to other forms of isolation used in the placement of both direct and indirect restorations. The two primary outcomes are stated as: the survival rate of restorations at 6 months, 1, 2, 5 and 10 years and any reported adverse events. The reviewers also aim to consider a number of secondary outcomes which include the assessment of restoration quality, cost and patient satisfaction.

As we would expect from a systematic review which follows the Cochrane methodology, a comprehensive literature search strategy was employed. This included searching for articles published up to 2016 with no language or geographical restrictions. Nine databases were searched including MEDLINE, Embase Ovid and the Cochrane Central Register of Controlled Trials. The reviewers also describe carrying out an extensive hand search of relevant journals and contacting authors as well as experts in the field to identify any unpublished trials. Both randomised and quazi-randomised control trials were considered for inclusion in the review *if* they comprised of an intervention arm with treatment under rubber dam and a control arm with treatment using another form of moisture control. Included trials could involve any type of direct or indirect restoration with no age or gender restrictions. In spite of these relatively broad inclusion criteria only four trials were identified which could be included in the systematic review.

The reviewers assess bias using the Cochrane Risk of Bias Tool[3]. This enables a clear assessment of potential biases in the design, conduct, analysis, and reporting of the included studies. The appraisal clearly demonstrates that all four included studies have a high risk of bias. The main domains where bias was noted were in receiving industrial funding (2 studies) and a lack of blinding of both patient and operator (4 studies). The later should be interpreted with some caution as it is important to remember that both patient and clinician cannot be blinded as to whether rubber dam was used or not. Blinding of the assessor who reviewed the restorations at follow-up was described in two of the studies.

Of the included studies, three reported outcomes in children who required fissure sealants and the restoration of primary molars. The remaining study included the restoration of non-carious cervical lesions under rubber dam. Due to the differences in the patient groups, clinical procedures and outcome measures the results from the studies could not be combined and so, although planned, a metanalysis was not carried out. The authors provide a narrative review of all four studies and summary statistics for only one. Results from two of the studies included in the systematic review demonstrated inconsistent reporting. Only one study demonstrated a significant difference of survival rate in favour of restorations placed under rubber dam. This study was however was deemed to be of 'very low quality' when assessed using the GRADE[4] assessment tool meaning that we can be very uncertain about this estimate.

None of the studies commented on either the 'adverse event' primary outcome, or any of the secondary outcomes of the review. A notable limitation of this review is that decisions around whether the use of rubber dam may improve the survival of restorations could only be drawn from one single study of very low quality evidence. The reviewers indeed conclude that "further high quality research evaluating the effects of rubber dam usage on different types of restorative treatments is required".

As typical of a Cochrane systematic review, a robust methodology was followed which allowed the reviewers to identify a lack of high quality randomised control trials that assess the use of rubber dam isolation in restorative dentistry. Worthy of note is that included studies only looked at the use of direct resin based restorations; none included other common restoration types or materials such as crowns or inlays and amalgam. It is therefore reasonable to conclude that the results of this systematic review would be unsupported as evidence to alter current practice.

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